

The listing of the claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

- 1.(currently amended) A method of forming a copper layer on a substrate, comprising:  
forming a copper oxide layer by atomic layer deposition comprising alternatively reacting a surface of the substrate with a ~~[[from a]]~~ non-fluorine containing copper precursor ~~[[on the substrate]]~~ and an oxygen containing gas; and  
reducing the copper oxide layer by contacting the copper oxide layer with a hydrogen containing gas to form a copper layer on the substrate.
- 2.(original) The method of Claim 1 wherein the steps of forming a copper oxide layer and reducing the copper oxide layer are carried out at substantially the same temperature.
- 3.(original) The method of Claim 2 wherein the steps of forming a copper oxide layer and reducing the copper oxide layer are carried out at a temperature in the range of about 100 to 300°C.
- 4.(currently amended) The method of Claim 1 wherein the step of forming a copper oxide layer ~~[[comprises depositing the copper oxide layer by atomic layer deposition comprising alternatively reacting the surface of the substrate with a non-fluorine containing copper precursor and an oxygen containing gas,]]~~ is carried out at a temperature below about 200°C.
- 5.(currently amended) The method of Claim ~~[[4]]~~ 1 wherein the non-fluorine containing copper precursor is a copper alkoxide, copper -diketonate or copper dialkylamide.
- 6.(original) The method of Claim 5 wherein said copper alkoxide comprises  $[\text{Cu}(\text{t-BuO})]_4$ , said copper -diketonate comprises  $\text{Cu}(\text{tetramethylheptadionate})_2$ , and said copper dialkylamide has the formula of  $[\text{Cu}(\text{NR}_2)]_4$  where R represents alkyl.
- 7.(currently amended) The method of Claim ~~[[4]]~~ 1 wherein said oxygen containing gas is ozone, oxygen, water or any mixture thereof.

8.(original) The method of Claim 1 wherein the step of reducing the copper oxide layer comprises reducing the copper oxide layer by contacting with a hydrogen containing gas at a temperature below about 200°C.

9.(currently amended) A method of forming a copper film on a substrate by atomic layer deposition, comprising:

introducing a non-fluorine containing copper precursor gas about a substrate provided in a chamber;

removing excess copper precursor gas from the chamber;

introducing an oxygen containing gas into the chamber to form a layer of copper oxide on the substrate;

removing excess ozone from the chamber; and

introducing a hydrogen containing gas into the chamber to reduce the copper oxide layer to form a copper layer; wherein the steps of forming the copper oxide layer and reducing the copper oxide layer are carried out at a temperature of below about 200°C.

Please cancel Claim 10.

10(cancelled).

11.(original) The method of Claim 9 wherein the steps of forming the copper oxide layer and reducing the copper oxide layer are carried out at a pressure in the range of about 100 mTorr to 10 Torr.

12.(original) The method of Claim 9 wherein the non-fluorine containing copper precursor is a copper alkoxide, copper -diketonate or copper dialkylamide.

13.(original) The method of Claim 12 wherein the non-fluorine containing copper precursor is selected from the group consisting of [Cu(t-BuO)]<sub>4</sub>, Cu(tetramethylheptadionate)<sub>2</sub>, and copper dialkylamide.

14.(original) The method of Claim 9 wherein the oxygen containing gas is ozone, oxygen, water, or any mixture thereof.

15.(original) The method of Claim 14 wherein the oxygen containing gas is ozone.

16.(original) The method of Claim 9 wherein the copper precursor is introduced at a flow rate in the range of about 1 to 1000 sccm.

17.(original) The method of Claim 9 wherein the copper precursor is introduced in pulse at a pulse time of about 0.01 to 10 seconds.

18.(original) The method of Claim 9 wherein the oxygen containing gas is introduced at a flow rate in the range of about 100 to 2000 sccm.